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ABSTRACT

A project was conducted in the Monmouth County (New Jersey) Vocational School District to examine the combination of in-shop vocational education with reading and mathematics instruction for special needs students. Related mathematics and reading teachers worked with students in small groups and individualized settings in the school shop to teach and reinforce mathematics and reading concepts necessary for the students to succeed. The vocational instructors, in conjunction with the related teachers and a learning disability teacher consultant, identified students' deficiencies. A team effort was then established to remediate student deficiencies through the team approach within the shop. To provide practical help for the students, a series of workbooks was developed incorporating the job skills needed in entry-level jobs of various occupations, such as plumber and carpenter. In addition to these workbooks, approximately 26 performance records, which include content objectives and corresponding activities (such as puzzles, word searches, and use of fractions through measurement), were completed. As a result of the project, students increased their sight-word skills and gained more confidence in reading the numerical material used in the shop. Recommendations were made concerning length of sessions, pretests for handicapped students, and program design. Appendixes include the reading and mathematics skills matrix, word lists and tests used for pre- and post-testing, and copies of student intervention schedules. (KC)

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MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT
2 BUCKS LANE
MARLBORO, NEW JERSEY
(201 431-7942)

FINAL REPORT
OF
RELATED READING AND MATHEMATICS
PROJECT

1981-82

CE034367

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PROJECT TITLE: Related Reading and Mathematics

LEGAL NAME OF APPLICANT DISTRICT, INSTITUTION OR AGENCY: Board of Education of the Vocational Schools in the County of Monmouth

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ABSTRACT

DESCRIPTION OF PROJECT

(Use this sheet and no more than one other to type in single-spaced form a statement of project objectives, procedures that were followed, state and local priorities emphasized and the expected contribution of the project to vocational education.)

Vocational teachers in special needs programs are faced with a wide variety of student academic disabilities which require unique instructional strategies to remediate. The problem encountered trying to spend shop time to teach necessary academic skills to handicapped students are often insurmountable. The need for repeated reinforcement on a regular basis of initially learned academic skills takes an inordinate amount of valuable shop time. The dilemma created is that of making a choice between teaching related math/reading or teaching necessary manipulative skills in the face of the reality of knowing one depends upon the other.

Research has demonstrated that handicapped students are often unable to transfer reading and math skills attained in an academic environment to a work or real life situation. However, it has been found that these skills when learned in a shop environment often are retained and students do transfer these learned skills to the academic environment.

This project was an attempt to combine, in the shop, the talents and expertise of the vocational teacher with that of the academic teacher. Related mathematics and reading teachers worked in the school shop to teach and reinforce math and reading concepts necessary for the student to succeed. Rather than removing the student from the work place the work environment was used by the related teacher to teach required academic concepts. The vocational instructor identified student deficiencies in conjunction with the related teachers and a learning disability teacher consultant. A team effort was then established to remediate student deficiencies through the team approach within the shop.

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A. Introduction

1. Problem

With a direction and a sensitivity toward the promotion of vocational education and independent employment for the special needs students, several issues arise regarding the various alternative methods, increased individualization, remediation and learning processes. With the necessity to provide a thorough and efficient vocational education to classified students, there is an underlined need for the development of more effective programs and instructional methods by incorporating related reading and math into the vocational curriculum.

This increased awareness purports that the handicapped have the same needs and interests in exploring vocational activities as the non-handicapped (Rumble, P., p. 134). As a result, teaching techniques are being adapted to meet these needs. The teachers are now encouraged to look at these students in a different perspective placing less emphasis on measured intelligence and, instead, considering learning styles and abilities, realistic expectations for the student, and adaptation of basic skills (Bies, J., p.67). The very nature of the handicapped student is actually influencing teachers to use various methods of teaching other than the traditional lecture-demonstration. It is evident that the use of the multi-dimensional teaching methods becomes imperative when one actually does attempt to match teaching styles to individual learning styles (Iano, R., p. 168).

The thrust of this orientation emphasizes the practical application of academic and theoretical concepts to a specific vocational shop in order to understand its connection with the real world. The problem arises not in the large variety of teaching techniques but in the diversity of intellectual and academic scatter of these handicapped students all assembled in one vocational shop and the lack of the ability to generalize or transfer the basic knowledge taught in the academic atmosphere of the vocational setting. The very nature of the special needs student dictates this need for individualization, so that the instruction can commence at the point of total understanding and comprehension for each student.

The Monmouth County Vocational School District, a shared-time area vocational school, is presently conducting 8 programs of vocational orientation with a cluster approach for a population of 80 handicapped students. These special needs students have some serious problems

transferring many concepts from classroom theory in the world of language and math to the specific trade experience in their vocational training. The vocational instructor, due to the nature of his/her instructional programs, has difficulty obtaining the necessary time to reinforce in a continual manner the many concepts of applied reading and math in vocational education.

In September, 1983, the Monmouth County Vocational School District will open a new building for special needs vocational education. This building will more than triple the handicapped student population in vocational education. With the opening of the new building the need for innovative approaches to the inculcation of reading and math skills will be greatly increased. This project will provide the base for the development of effective strategies for insuring job placement and retention of special needs students.

2. Objectives

a. To demonstrate significant growth in handicapped student's recognition of sight word vocabulary as related to specific occupation.

b. To transfer the comprehension of technical information to problem-solving situation as related to manipulative/survival skills.

c. To demonstrate the application of addition, subtraction, multiplication and use of the ruler to problem-solving situation as related to manipulative and vocational/survival skills.

d. To demonstrate that reading and math skills can be increased through the intervention of related specialists, teaching these skills in the shop with shop tools and equipment.

3. Related Research

Being faced with the varied scatter of academic abilities, the shop instructor must draw on all resources available, from multi-media techniques to supportive personnel. Gardiner (1979) devised modules which provided supplemental instructional support in technical vocabulary for graphic arts students with disabilities. It was evident "without exception" that all students comprehended the terms. Adkins (1979) demonstrated a successful adaptation of a remedial math program with its emphasis on the fact that the time spent in math was a very "purposeful march toward a clearly defined practical goal; the student was made aware of the goal and its meaningful relationship to the shop program".

Friedman (1980) took the opportunity to reinforce learning that takes place in a special needs home economics class. She found innovative ways of reinforcing instruction that starts in the home economics class. For example, fractional measurement used in cooking and sewing, once demonstrated in the practical situation of the home economics lab becomes easier to understand. It has also been found that this individualized attention to the student has had the desired effect of allowing each one to make specific advances. For example, the student who had taken part in the special needs class for only one year was advanced to the regular food and nutrition program. He/she was able to participate in the regular class largely because of the individualized instruction. Thus, this supplemental help would facilitate the number of special needs students who would be mainstreamed.

There is also evidence that teaching basic skills through the vocational shop media incorporates retention and carry over into the academic areas. Porter (1980) found that students are likely to learn and retain basic academic skills in the functionally designed vocational courses where the acquisition of new skills and concepts or the application of previous learning is focused on job-related tasks.

Vocabulary worksheets for each unit in industrial arts class were formulated by Millman (1980). With the help of supportive teachers, he designed groups of words with common roots which were directly related to the vocational curriculum. He has even indicated evidence of a carry over into the academic areas. Allnock (1981) finds that instructors sometime forget the basic lesson of proper spelling and use of technical words. Because these words are in daily use, teachers take them for granted. When the student encounters the words in texts and worksheets, they frequently have trouble pronouncing, much less spelling them correctly. Through individualized remediation and supplemental help, the student is taught the vocabulary necessary to achieve competency in the curriculum.

Thus, it is evident that the approach of individualized support in the vocational shop and the utilization of shop-related equipment as a vehicle to teach basic concepts can develop and retain basic skills even to the point of carry over into the academic sphere. The use of shop-related equipment also alleviates the problem of transfer of learning which has become a topic of interest in the vocational program. In the past, it has been taken for granted that the basic math and reading in the academic classes would be automatically transferred to the vocational skills

program, but as the vocational programs are reviewed, there is cause for concern that one problem stems from the inability of the student to transfer the learning which has occurred in one situation to another or real-life situation. A handicapped person may learn a given mechanical procedure such as adding a column of figures but is not able to apply this skill to a problem-solving situation. These students have difficulty gaining insights into such processes and have serious limitations in applying what they have learned to similar situations or sensing the generalized applications to somewhat novel situations (Schworm, R., p. 147).

Wehman (1976) in his research, stated that in other areas, the transfer of vocational skills is not guaranteed upon learning. A more complete training program should, therefore, not only include the basic skills taught in the academic setting, but also re-adapted and taught in the vocational setting. Traditional research has also verified the deficiency of the handicapped to use previously learned experiences in new and unique situations. Denny (1964) found that handicapped subjects showed resistance to change environment when learning a task, and exhibited a susceptibility to distraction when the task was irrelevant. He concluded that verbal learning reflects poor performance in verbal rote memorization and abstraction tasks.

Taking the lack of transference into consideration, researchers have probed into how and when this phenomemon is best minimized. One positive factor is the influence of task similiarity. Hirsch and Lowman (1965) discovered that performance skills were more effectively acquired, transferred and retained when a greater amount of the initial task is carried over into a new task. Langone (1977) illustrated the example of simple custodial care:

> The practioner should begin instruction for floor sweeping by taping off a small segment of the classroom for an individual to practice sweeping. When the amount of sweeping space has been enlarged to include the entire classroom, new steps, established gradually, should be incorporated.

Barnett (1959) found that adding practical relevance and giving the stimulus a distinct name added in transference when the subject was to discriminate between the two stimuli. Miller and Griffeth (1961) found that

handicapped students, pre-trained with vocabulary, performed significantly better on the nouns used in training, thus, resulting in improved conceptual performance. However, they performed no better than the untrained subjects on materials not used in training. It may be concluded that retention and transference may be limited to the material used directly in training.

Prehm (1966) and Katz (1963) experimented within a school simulated setting and discovered that when attempting to teach technical principles, the handicapped transferred more readily when general understanding rather than when rote learning is used. Smith (1961) concluded with the same results that the learning of an initial task and transfer of learning are facilitated if the task is one that is interesting and easily related to the subject.

It is the task of the instructional planner to tie these various components into a systematic cohesive plan. With planning, the teacher should be able to develop activities that incorporate gradual changes in setting, conditions, persons, times, materials, and reinforcement. It is obvious that in order to transfer learning adequately, programmed generalization must occur especially in the development of vocational skills by the handicapped. Inclusion of this training procedure in vocational preparation may be as important as the skills itself (Langone, J., p. 221).

B. Report

1. Procedures

a. General Design

This project made use of small group and individualized instruction utilizing shop competencies and, where feasible, shop equipment to reinforce the retention of reading and math skills necessary for success in the vocational curriculum. Students participated on the basis of results of pre-tests and shop teacher recommendations. The related teachers attempted to remediate and reinforce reading and math skills particular to the program within the shop environment.

b. Target Population

Participants in this project were selected from those classified students enrolled in the Occupational Education Program for Exceptional Children at the Monmouth County Vocational School District. A matrix was organized for each shop as a result of the testing (Appendix A). It illustrated those students who showed deficiencies in the related academic skills which are necessary for a successful vocational orientation. Students were chosen for the program on the basis of degree of deficiency, instructor recommendation, and behavioral compatability. Consequently, sixteen students were chosen for the related reading program and sixteen students were selected for the mathematics program.

c. Management Plan

This project involved the cooperative efforts of the project director, project coordinator, building principal and two part-time related instructors. The project coordinator designed pre and post evaluation instruments, pre-tested each student, developed the instructional matrix and prepared the evaluation of project results. The related teachers were responsible for remediating identified deficiencies within their specialized area. The building principal supervised the instruction provided by the related teachers.

d. Test Selection and Formulation for Student Population

Standardized test selection proved ineffective due to the specificity of mathematics and reading skills as related to a particular shop. Thus, informal pencil and paper tests were formulated in cooperation with the vocational instructor.

In reading, emphasis was placed on word recognition and a list of the most frequently used words in the particular shops was compiled (Appendix B). An additional list of survival words was given to students when these skills were an integral part of the curriculum. The reading tests were administered individually and orally. The Slosson Oral Reading Test (SORT) was also given to examine the extent of transfer, if any, to the academic sphere.

The format followed for the informal reading test was identical to the format of the SORT.

In mathematics, tests were developed for each shop in conjunction with the vocational instructor. Test items were generated on the basis of practicality, pertinence, and relevance to a particular vocational skill. The tests were pencil and paper, in nature, and were conducted in a group setting (Appendix C). All students were administered those tests explicitly related to their particular shop. As a result of the testing, the proficiency of the entry level skills and the current level of functioning of the students was determined.

e. Scheduling of Students

The students were scheduled for thirty to forty minute periods of instruction of related mathematics or reading within the shop environment for two to three days per week (Appendix D). Two buildings were involved in this program and the related teachers alternated days in each building. The mathematics teacher concentrated her time in the building which housed those occupations which are math related, for example, carpentry and plumbing. The reading teacher concentrated on those programs which principally incorporated survival skills.

f. Related Teacher Instruction

On the basis of the matrix, the related teachers correlated the specific objectives with the vocational competencies being taught during a given time frame.

Individualized lesson plans were included for each student which stated the specific objectives, activities, materials used, progress, and grade (Appendix E). This enabled continuity between the instructors and the entry level skill objectives and kept an accurate account of each student's progress.

Individualized reading and mathematics techniques were adapted to the vocational framework to enhance the application of academic and theoretical principles to a vocational skill and show its importance to the student utilizing vocational skills as a vehicle.

Daily communication with the vocational instructor kept the reading and mathematics within a vocational and practical focus. The equipment in a given shop was utilized as an agent of transfer from the theoretical to practical application.

g. Materials Development

One of the objectives of this program was to develop activities utilizing shop equipment and a multi-sensory approach to teach level-entry skills in a vocational setting. Performance Records were compiled for each objective which stated the content objective, primary activities (Appendix F). This Performance Record enhanced the compilation of the various hands-on and pencil-and-paper tasks utilized throughout the instructional process. It served as a precursor for the formulation of workbooks and practical activities affiliated with a specific level-entry skill. As a result, the following workbooks were developed:

TITLE	PROGRAM	CONTENT OBJECTIVES
Fun With Food	Service Cluster	Application of Terminology found in cookbooks, containers, recipes and restaurant menus
Fractions & Measurement	Plumbing	Distinguishing between different diameters of pipe
Home Heating Systems	Plumbing	Application of terminology necessary to discuss and follow directions involving heating system
Job Search	Manufacturing	Application of terminology found on job application forms
Food Service Terminology	Service	Recognition and application of terminology related to Food Service
Basic Engine Parts	Transportation	Recognition and understanding applied to engines and their components

TITLE	PROGRAM	CONTENT OBJECTIVES
Understanding Advertisements	Manufacturing	Computing sale price savings
Working in a Warehouse	Manufacturing	Recognition and understanding terminology commonly used in a warehouse
Time Card Computation	Manufacturing	Computing daily and weekly work hours
Carpenters Helper	Carpentry	Recognition and application of carpentry terminology

In addition to these workbooks, there are approximately twenty-six completed Performance Records which include content objectives and corresponding activities. Some of these successful activities in reading include the cloze and maze procedure, wordgrams, puzzles, word searches and the practical activities applicable to the shop. In mathematics, some of the procedures include the instruction of fractions through measurement, alternate algorisms, and teaching of decimals with a feeler gauge. These techniques proved to be appropriate vehicles in which to teach mathematics.

2. Findings

In reading, the students were post-tested with the same format as the pre-test.

TABLE I

TEST	MEAN INCREASE
Survival Words	+19.4
Shop Words	+36.4
SORT	+01.48

Table I illustrates the degree of increase in word recognition scores. In the area of Survival Words, the students increased their vocabulary by an average of 19.4 words; from the Shop Words, 36.4 words; and in the SORT, the students showed an increase of 1.48 grade levels. (Appendix G)

In mathematics, the X's listed on the matrix show a sufficiently severe deficiency to warrant remediation (Appendix H). Those encircled

indicate that the student has mastered the specific skill to the satisfaction of the vocational instructor. These students were not only post-tested with the written test but also showed a satisfactory transfer of knowledge through the use of a practical test utilizing shop equipment. In inadequate amount of time did not allow for all X's to be eliminated.

3. Interpretation of Findings

As a result of the remediation in reading, the student increased his/her repertoire of sight-word vocabulary sufficiently to be noticed by the shop instructor through increased proficiency in oral conversation and understanding, reading of tests, and understanding of related reading material. In mathematics, the students appeared to have more confidence in reading numerical tables found in shop manuals, reading gauges, measurement and a general application of mathematical principles within the shop setting.

4. Dissemination

The results of the project are to be disseminated throughout the Monmouth County Vocational School District. This report will be submitted to the State for dissemination to other districts. Papers will be prepared for presentations at County, State and National professional meetings.

5. Sex Bias and Sex Role Stereotyping

Project materials, tests and activities were thoroughly scrutinized to assure that no sexual bias or sex role stereotyping existed in them. Every attempt was made during the project to show role models in non-traditional areas. The project emphasis, which was to teach related math or reading in the shop with shop equipment, provided the opportunity for the related teachers to function in a non-traditional role.

C. Summary

1. Conclusions

In terms of achievement of stated goals, the students showed improved performance in the recognition of sight word vocabulary as related to a specific occupation. The students illustrated the transfer of comprehension of technical information as taught by the related teacher

to problem solving situations in regard to manipulative/survival skills. The students also demonstrated the application of related academic subjects to vocational instruction. Real-life situations were simulated in the shop and the student's resolution process was transferred. It's practical, realistic, and closely simulated procedures to a work environment encouraged this transfer, retention, and generalization of the skills necessary for successful employment. This program also systematically analyzed those academic level-entry skills which are necessary for mastery of vocational competencies. It also showed that it is feasible for two disciplines, that of the related teacher and the vocational instructor, to inter-correlate their expertise for comprehension of given employability tasks within a shop setting.

2. Recommendations

As a result of the incorporation of the related instructors into the vocational program, several interesting observations occurred. Some students requested to be placed in the mathematics program even though their pre-test scores did not warrant intervention. The shop teachers investigated some of the teaching techniques used by the related teachers in small group settings. Work sheets and activities were compiled into workbooks for each specific competency. Each vocational unit now has a hands-on and accompanying workbook to reinforce basic skills.

Teacher comments indicate that instead of a thirty to forty minute session three times per week, the student should have a full two hour session once a week. This would alleviate the problem of the student leaving shop projects in the midst of vocational instruction. It was also suggested that the highly distractible students be given the alternative of acquiring instruction in a simulated learning center in another classroom when machine noise level is high.

The approach of the written pre-tests toward some of the handicapped students was inappropriate. The test should be revised to accommodate hands-on activities and simulated employment conditions for testing purposes. It may be advisable to lift segments of the vocational instruction for testing purposes and incorporate some of the activities adapted from the workbooks.

In this particular program, a limited number of students were selected to participate. In the future, possibly all students could be incorporated in a series of small group sessions. This would further integrate the related instruction into the mainstream of the vocational curriculum. This type of scheduling would also be conducive to full classroom instruction with the related teacher and vocational instructor in a team effort.

In reading, the testing should expand not only in the area of word recognition, but also in the area of comprehension and possibly spelling, when applicable. A pre-test could be established using the strategies in coordination with the workbooks and textbook.

Continual program information for the teachers and students should be further developed. Although the vocational instructors were involved in its initial implementation, on a formal basis, this was not continued. Weekly informal conferences should have been held to air feelings, attitudes, concerns and suggestions as the program progressed. Many positive ideas surfaced at the end of the program which could have been implemented without changing the structure of the program.

For instance, the students became acquainted with the program during the pre-test procedure but follow-up information conferences ceased. Greater effort should be put forth in stating the test results to each student, the specific objectives to be achieved, and, its direct relationship to the particular vocational field. After the objectives were successfully completed, the students would then terminate the related program and continue with the vocational competencies. This was not clearly stated to the students and some resistance and hesitancy prevailed until the student realized that when the specific deficiencies were eliminated, he/she would then end the related instruction until a future deficiency was noted. It could have taken on the appearance of a contractual form of agreement between the teacher and student. Students were also not given grades. Future programming may include a grade to be averaged with the vocational grade.

An accumulation of the successful strategies and techniques in reading and mathematics should be organized into an in-service program for vocational instructors to better understand the nature of the related instruction and

incorporate those measures which fit into the scheme of their teaching environment. The vocational instructors could also share their experiences concerning the feasibility of these strategies in the shop environment and offer suggestions for improved effectiveness.

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APPENDIX A

READING AND MATHEMATICS SKILLS MATRIX

Carpentry

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading & Mathematics Skill Matrix

Students	MULTIPLICATION												ADDITION OF FRACTIONS					SUBTRACTION OF FRACTIONS				MEASUREMENT				
	Tables	1-5	6-9	2x1	3x1	2x2	3x2	3x3	Operations	Decimal to Fractions	Fractions to Decimal		Reducing	Like Denomination	Unlike Denomination	Mixed Numbers		Like Denomination	Like Denomination Mixed Numbers	Unlike Denomination	Unlike Denomination Mixed Numbers	Whole Numbers	1/2	1/4	1/8	Reading
W. D.													X		X									X	X	100
H. H.																										83
K. M.										X	X															
J. B.										X	X		X	X	X	X		X	X	X	X			X	X	92
T. H.										X	X		X		X	X				X	X					76
R. C.										X	X		X	X	X	X				X	X					98
J. C.										X	X															62
W. R.	X		X		X		X		X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	10
S. L.	X		X		X		X		X	X	X							X	X	X	X		X	X	X	91

MANUFACTURING

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading and Mathematics Skill Matrix

Students	Addition			Subtraction		Multiplication								Time					Division		Measurement		Word Problems	Reading
	Without Carrying	With Carrying	4 Addends	Without Regrouping	With Regrouping		Tables 1-5	Tables 6-9	Multiplies 2x1	Multiplies 2x2	Multiplies 3x2	Multiplies 3x3	Operation	Hour	1/2 Hour	1/4 Hour	Minutes	Writing Time in Numbers	One Digit Divisor	Two Digit Divisor				
A. K.			x	x	x			x		x	x	x	x	x	x	x	x	x	x	x	x		x	38
D. D.					x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	48
R. V.																								
T. M.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	73
S. S.		x	x				x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	80
M. P.		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	23
E. M.		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	22

Plumbing

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading and Mathematics Skill Matrix

	MEASUREMENT				MULTIPLICATION											
STUDENTS:	1"	1/2"	1/4"	1/8"	Tables 1-5	6-9	2x1	3x1	2x2	3x3	Operation	Rounding of No. 10's	Rounding of No. 100's	Angles	Word Problems	Reading
R. T.																100
H. S.															X	100
C. C.											X				X	81
K. R.		X	X	X									X	X	X	93
T. P.		X	X	X		X						X	X	X	X	60
A. D.										X		X	X	X	X	8
A. D.			X	X								X	X	X	X	99
E. C.		X	X	X		X							X		X	47
M. L.	X	X	X	X	X	X	X	X	X	X	X	X	X		X	88
K. L.									X	X	X				X	84

SERVICE

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading and Mathematics Skill Matrix

STUDENTS:	Addition				Subtraction			Multiplication							Division		Measurement				Fractions				
	Without Regrouping	Regrouping	3 Digit Numbers	3 or More Addends	Without Regrouping	Regrouping	Zeros in Subtrahend	Tables 1-5	Tables 6-9	Multiplies 2x1	Multiplies 2x2	Multiplies 3x2	Multiplies 3x3	Operation	With Remainders	Without Remainders	1"	½"	¼"	1/8"	Reducing Fractions	Double & Half	Measures Equivalent	Word Problems	Reading
J. S.											X		X		X	X		X	X	X		X	X		99
J. T.													X	X	X	X		X	X	X	X	X	X		98
G. M.															X	X	X	X	X	X	X	X	X		30
P. N.									X			X		X	X	X	X	X	X	X	X	X			95
L. B.						X	X				X	X	X	X	X	X	X	X	X	X	X	X		X	97
M. I.				X		X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	91
M. F.			X			X	X		X		X		X	X	X	X	X	X	X	X	X	X		X	90
S. V.						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	28
C. M.		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	45
N. R.						X	X		X				X	X	X	X	X	X	X	X	X	X	X	X	99

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Reduced Reading & Mathematics Skill Matrix

STUDENTS:	ADDITION		SUBTRACTION		MULTIPLICATION						DIVISION		MEASUREMENT							
	Without Carrying	With Carrying	Without Regrouping	With Regrouping	Tables 1-5	6-9	2x1	2x2	3x2	Operation	Without Remainder	With Zeros	1 Inch	1/2	1/4	1/8	Decimal to Fractions	Fractions to Decimal	Angles	Reading
H. P.														X	X	X			X	96
R. C.																				31
M. B.														X	X	X				100
S. S.		X							X					X	X	X				96
R. G.						X		X		X				X	X	X		X	X	78
D. J.			X	X		X		X									X	X	X	83
J. L.													X	X	X	X	X	X	X	84
J. C.										X				X	X	X	X	X	X	60
G. P.		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	32
M.F.													X	X	X	X	X		X	

APPENDIX B

WORD LIST USED FOR PRE AND POST TESTING IN THE RELATED READING PROGRAM

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

CARPENTRY WORD LIST

Name_____ Age_____ Date_____

School_____ Examiner_____

List 1	List 3	List 5	List 7	List 9
1. nail	1. belt	1. spiral	1. jointer	1. countersink
2. saw	2. fence	2. table	2. spirit	2. expansive
3. drill	3. file	3. saber	3. clamp	3. screwdriver
4. plane	4. bar	4. trim	4. transit	4. telescope
5. line	5. kerf	5. sander	5. builder	5. vertical
6. rule	6. sill	6. miter	6. tripod	6. horizontal
7. tape	7. wall	7. ratchet	7. angle	7. cripple
8. tilt	8. level	8. gauge	8. plumb	8. spacer
9. knob	9. square	9. guard	9. cement	9. toenail
10. hack	10. chalk	10. joint	10. concrete	10. rafter
_____	_____	_____	_____	_____

List 2	List 4	List 6	List 8	List 10
1. back	1. brace	1. roof	1. footing	1. common
2. rip	2. bevel	2. shingle	2. joist	2. router
3. block	3. handle	3. window	3. plate	3. asphalt
4. hand	4. depth	4. door	4. subfloor	4. sheathing
5. push	5. auger	5. mason	5. hammer	5. cornice
6. claw	6. keyhole	6. combination	6. header	6. sliding
7. skill	7. crosscut	7. utility	7. stud	7. plywood
8. band	8. putty	8. radial	8. rough	8. chisel
9. jig	9. curved	9. double	9. sole	9. ceiling
10. bit	10. hatchet	10. corner	10. post	10. carpenter
_____	_____	_____	_____	_____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

MANUFACTURING WORD LIST

Name_____ Age_____ Date_____

School_____ Examiner_____

List 1	List 2	List 3	List 4
1. fee	1. bill	1. rotation	1. apron
2. check	2. lading	2. damage	2. carrier
3. bay	3. clerk	3. weighing	3. delivery
4. bin	4. cash	4. consignee	4. string
5. rack	5. discount	5. wholesaler	5. spot
6. seal	6. notice	6. marking	6. handle
7. sale	7. order	7. forwording	7. requisition
8. zone	8. shipment	8. address	8. perishable
9. packing	9. partial	9. inventory	9. shipping
10. girth	10. copy	10. credit	10. special delivery
11. winch	11. conveyor	11. terms	11. materials handling
12. invoice	12. inventory	12. receipt	12. corrugated
13. fragile	13. routing	13. distribution	13. certified
14. gross	14. ticket	14. conveyor	14. valuation
15. freight	15. arrival	15. flatbed	15. expediting

List 5	List 6	List 7	List 8
1. report	1. partnership	1. fiberboard	1. gross
2. piggy back	2. partitions	2. cardboard	2. union
3. physical	3. staple	3. rebate	3. demurrage
4. request	4. item	4. clause	4. gondola
5. concealed	5. package	5. order	5. transit
6. grievance	6. interstate	6. distribution	6. sign
7. interstate	7. container	7. liability	7. commerce
8. origin	8. process	8. transit	8. common
9. auditing	9. private	9. bill	9. door
10. back order	10. double	10. cash	10. wrap
			11. value
			12. forklift

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

PLUMBING WORD LIST

Name_____ Age_____ Date_____

School_____ Examiner_____

List 1	List 3	List 5	List 7	List 9
1. drill	1. strap	1. code	1. sewer	1. horizontal
2. saw	2. cap	2. flange	2. compress	2. lavatory
3. torch	3. crown	3. faucet	3. coupling	3. nominal
4. vise	4. dip	4. flange	4. fitting	4. reducer
5. wrench	5. vent	5. water	5. fixture	5. sanitary
6. drain	6. weir	6. loop	6. plumbing	6. synphonage
7. grade	7. backflow	7. flush	7. sewage	7. vertical
8. pitch	8. elbow	8. pool	8. solder	8. cast iron
9. valve	9. finish	9. private	9. plumber	9. atmosphere
10. oil	10. flux	10. vacuum	10. industrial	10. reducer
_____	_____	_____	_____	_____

List 2	List 4	List 6	List 8	List 10
1. plug	1. thread	1. angle	1. copper	1. temperature
2. ream	2. relief	2. bender	2. outlet	2. vanity
3. well	3. storm	3. chisel	3. propane	3. acetylene
4. sink	4. stack	4. cutter	4. ballcock	4. potable
5. trap	5. union	5. flaring	5. pressure	5. accessible
6. tubing	6. meter	6. hammer	6. distribution	6. connection
7. valve	7. heater	7. level	7. apprentice	7. combination
8. tub	8. unit	8. pliers	8. adapter	8. dishwasher
9. wheel	9. pressure	9. reamer	9. chemical	9. individual
10. claw	10. zinc	10. bathtub	10. offset	10. pollution
_____	_____	_____	_____	_____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

SERVICE CLUSTER WORD LIST

Name_____ Age_____ Date_____

School_____ Examiner_____

List 1	List 3	List 5	List 7
1. dot	1. grill	1. meat	1. pound
2. fat	2. mix	2. over	2. table
3. dice	3. milk	3. chop	3. scald
4. cube	4. bake	4. drain	4. knead
5. cup	5. cake	5. melt	5. heaping
6. food	6. pare	6. truss	6. grease
7. pint	7. dust	7. cut	7. dash
8. pot	8. beat	8. stew	8. boil
9. sift	9. stove	9. batter	9. poach
10. roll	10. sear	10. flour	10. simmer
11. stir	11. baste	11. pinch	11. tablespoon
12. toss	12. cream	12. chill	12. quart
13. whip	13. meal	13. fruit	13. roast
14. spoon	14. blend	14. mince	14. gallon
15. fry	15. fold	15. grate	15. cook
_____	_____	_____	_____

List 2	List 4	List 6	List 8
1. bread	1. brush	1. level	1. protein
2. dairy	2. directions	2. sifter	2. prepare
3. sliver	3. beater	3. preheat	3. tablespoon
4. ounce	4. marinate	4. toast	4. ingredients
5. parboil	5. dredge	5. vegetable	5. calorie
6. steam	6. braise	6. steam	6. broiler
7. dough	7. potholder	7. teaspoon	7. kitchen
8. grater	8. garnish	8. vitamins	8. knife
9. combine	9. measure	9. saute	9. fillet
10. napkin	10. cookie	10. receipe	10. cereal
_____	_____	_____	_____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

TRANSPORTATION WORD LIST

Name_____ Age_____ Date_____

School_____ Examiner_____

List 1	List 3	List 5	List 7	List 9
1. melt	1. stop	1. socket	1. degree	1. aluminum
2. paper	2. break	2. gasket	2. directions	2. distributor
3. brass	3. oil	3. important	3. expand	3. diameter
4. bolt	4. job	4. contract	4. function	4. hydraulic
5. stretch	5. die	5. filter	5. extension	5. battery
6. answer	6. punch	6. interview	6. timing	6. crank shaft
7. pull	7. bend	7. figures	7. magneto	7. piston rings
8. steel	8. twist	8. response	8. install	8. cylinder
9. gauge	9. spark	9. safety	9. bearing	9. application
10. dome	10. design	10. total	10. inflate	10. carburetor
_____	_____	_____	_____	_____

List 2	List 4	List 6	List 8	List 10
1. weld	1. file	1. pressure	1. acid	1. insurance
2. stud	2. heat	2. washer	2. grinder	2. instruction
3. tap	3. wire	3. piston	3. policy	3. lubrication
4. top	4. goggles	4. misfire	4. casting	4. mechanic
5. nut	5. surface	5. ratchet	5. puller	5. transmission
6. skirt	6. chisel	6. hammer	6. bottom	6. automobile
7. float	7. flywheel	7. fluid	7. wrench	7. temperature
8. drill	8. toward	8. advance	8. ignition	8. circumference
9. rules	9. length	9. wrist pin	9. radius	9. compression
10. tire	10. journal	10. torque	10. clearance	10. temperature
_____	_____	_____	_____	_____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

SURVIVAL SKILLS WORD LIST I

Name_____ Age_____ Date_____

School_____ Examiner_____

List 1	List 3	List 5	List 7
1. push	1. wet point	1. fallout shelter	1. bank
2. end	2. private	2. information	2. private property
3. down	3. slow down	3. no trespassing	3. hotel
4. exit	4. ladies	4. out of order	4. U.S. mail
5. open	5. stop ahead	5. lane ends	5. self service
6. out	6. don't walk	6. dangerous curve	6. take one
7. pull	7. no smoking	7. restaurant	7. no loitering
8. dip	8. keep out	8. railroad	8. this end up
9. gate	9. emergency	9. slippery when wet	9. stairway
10. stop	10. fire escape	10. fire alarm	10. combustible
_____	_____	_____	_____

List 2	List 4	List 6	List 8
1. next	1. hands off	1. use other door	1. city hall
2. man	2. do not enter	2. custodian	2. delicatessen
3. up	3. watch your step	3. take a number	3. out to lunch
4. dentist	4. one way	4. no soliciting	4. public invited
5. doctor	5. playground	5. shopping center	5. no admittance
6. found	6. road closed	6. coin return	6. handle with care
7. police	7. elevator	7. restrooms	7. poison
8. posted	8. men working	8. wet paint	8. caution
9. women	9. this side up	9. employees only	9. telephone
10. walk	10. do not cross	10. construction	10. keep out
_____	_____	_____	_____

APPENDIX C

TESTS USED FOR PRE AND POST TESTING IN THE RELATED MATHEMATICS PROGRAM

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Carpentry Math Test

Name_____ Age_____ Date_____

School_____ Examiner_____

1. A crew of four worked 24 hours, 18 hours and 22 hours. What is the total number of hours worked? _____

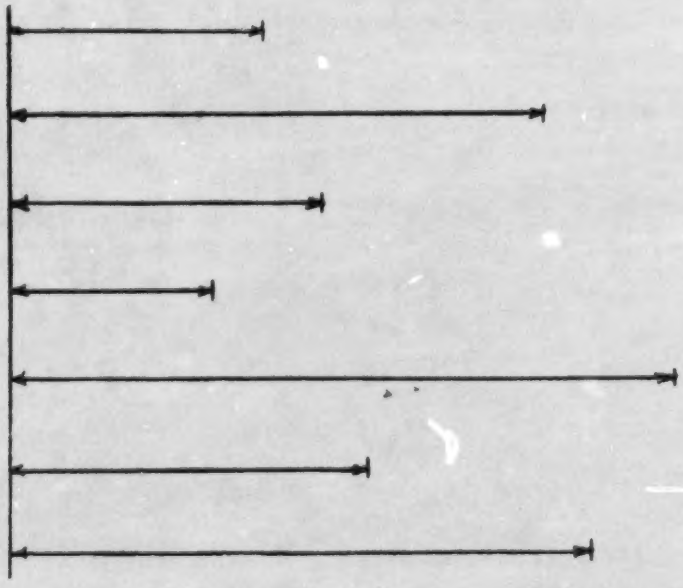
2. A carpenter built a redwood deck for $450.00. His material and labor cost $365.00. What is the profit? _____

3. The cost of a new garage is $4,755.00. Find the total cost of building 13 garages of this kind. _____

4. A shed door is made of one piece of 3/4 inch plywood and 1 piece of 1/4 plywood. How thick is the door? _____

5. What is the thickness of a board 7/8 inch thick after 1/16 is planed off one side? _____

Measure the following lines:



6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

Add:

$\frac{1}{5} + \frac{2}{5}$ _____

$3\frac{1}{4} + 2\frac{1}{4}$ _____

$\frac{1}{3} + \frac{1}{4}$ _____

$7\frac{1}{4} + 5\frac{2}{5}$ _____

Subtract:

$\frac{5}{8} - \frac{2}{8}$ _____

$4\frac{5}{6} - 2\frac{4}{6}$ _____

$\frac{1}{2} - \frac{1}{8}$ _____

$12\frac{3}{5} - 7\frac{5}{6}$ _____

Reduce to Lowest Terms:

$\frac{4}{8}$ _____ $\frac{8}{24}$ _____ $\frac{12}{24}$ _____

Multiply:

9×8 _____ 23×2 _____ 47×3 _____ 49×7 _____ 495×3 _____

89×20 _____ 235×300 _____ 68×37 _____ 473×65 _____ 42×9 _____

Change into Decimals:

$\frac{1}{2}$ _____ $\frac{1}{8}$ _____

$\frac{3}{4}$ _____ $\frac{5}{8}$ _____

$\frac{1}{4}$ _____

Change to Fractions:

.125 _____

.25 _____

.625 _____

.50 _____

.75 _____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Plumbing Math Test

Name_____ Age _____ Date_____

School _____ Examiner _____

Complete the following problems:

1. A plumbing supply house billed a plumber for the following amounts:

March	$1,244.00
April	3,200.00
May	4,175.00

How much was the total bill for the three month period? _____

2. A plumber earned $9.00 an hour and worked 35 hours per week. How much were the gross earnings for one week? _____

3. A plumber drained 121 gallons of water from a 275 gallon tank. How much water is left in the tank? _____

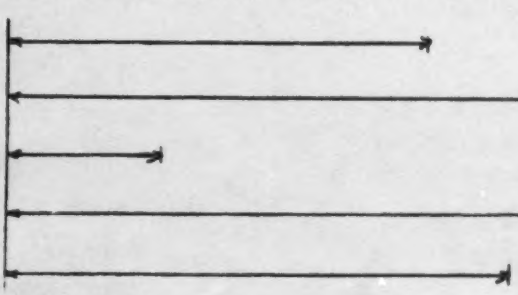
4. A plumber cut a length of pipe into 8 equal pieces. Four pieces were used. What fractional part of the pipe was used? _____

5. Of the 20 shower fixtures installed in a new housing development 4 were faulty. What fractional part of the show fixtures was faulty? _____

6. Copper tubing was stored on 1/7 of the pipe rack, plastic pipe on 3/7 of the rack, and 1/7 of the rack was used to store steel pipe. What part of the rack was used? _____

7. A plumber cut 13 7/8 inches from a 22 3/16 inch pipe. Find the new length of the pipe. _____

Measure the following lines:



8. _____
9. _____
10. _____
11. _____
12. _____

13. Multiply the following problems:

9 x8 ____	22 x2 ____	26 x3 ____	46 x7 ____	495 x 3 ____
89 x20 ____	235 x300 ____	68 x37 ____	473 x65 ____	42 x9 ____

Round off the following numbers to the nearest ten:

43 _____	81 _____	32 _____	9 _____
21 _____	118 _____	149 _____	367 _____

Round off the following numbers to the nearest hundred:

531 _____	1,658 _____	79 _____
387 _____	4,289 _____	2,549 _____

Measure the angles of the fittings below:

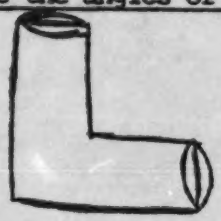
_____	_____	_____
_____	_____	_____

Round off the following numbers to the nearest hundred:

531_____ 1,658_____ 79_____

387_____ 4,289_____ 2,549_____

Measure the angles of the fittings below:



_____

_____

_____

_____ _____ _____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Manufacturing Math Test

Name_____ Age_____ Date_____

School_____ Examiner_____

1. Apex Manufacturing Company ordered

   59 green notebooks
   60 blue notebooks
   7 yellow notebooks

   How many notebooks did they order? _____

2. Capital Company ordered 1,000 boxes. They received only 543 of the boxes. How many boxes must be reordered? _____

3. A production worker is asked to put 5 different toy cars in a box. There are 4 boxes in a carton. How many cars are there altogether? _____

4. There are 30 bottles on the assembly line and six cartons. You are asked to put the same number of bottles in each carton. How many bottles will be in each carton? _____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Food Service Math Test

Name_____ Age_____ Date_____

School_____ Examiner_____

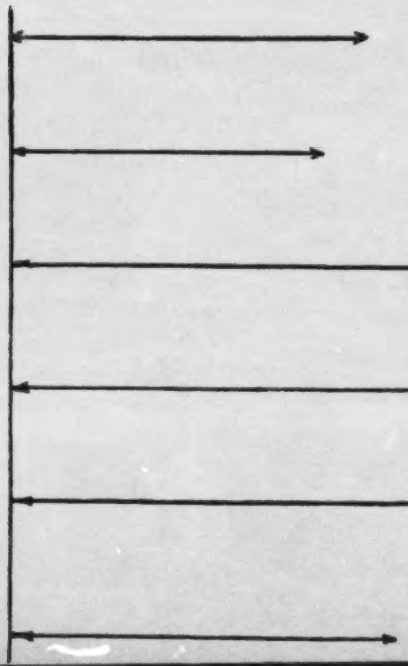
1. The bakery salesperson sold
   6 dozen donuts in the morning
   11 dozen donuts in the afternoon
   23 dozen donuts in the evening
   How many dozen donuts did the salesperson sell all day? _____

2. The five star bakery ordered 1,000 pounds of high-gluten flour. It used 627 pounds in one week. How much was left at the end of the week? _____

3. At the Skylark bakery, a batch of white bread dough weighs 544 pounds. Four batches are made daily. How many pounds of dough are produced in one day? _____

4. How many loaves of bread can be produced from a batch of dough weighing 1,332 pounds, if each loaf is scaled at 2 pounds? _____

Measure the following lines:



_____

_____

_____

_____

_____

_____

Measure the following lines: (cont.)

_____

5. Double the following recipe:

1 cup flour _____

½ teaspoon salt _____

1 ½ cups sugar _____

3/4 teaspoon pepper _____

6. Halve the following recipe:

2 cups carrots _____

½ cup cinnamon _____

4 teaspoons butter _____

1 ½ teaspoons salt _____

ADD:

15	37	78	968	909
+33	+8	+91	+356	6
				93
				+1542

SUBTRACT:

39	63	146	640	5068
-17	-28	-89	-573	-849

MULTIPLY:

32	48	205	447
x4	x16	x74	x270

DIVIDE: 3/2496 8/156 76/942 13/1405

Answer the following questions:

How many ounces are in a pound? _____

How many eggs are in a dozen? _____

How many pints are in a quart? _____

How many cups are in a quart? _____

How many pints are in a cup? _____

Reduce to lowest terms:

1/2 _____

3/9 _____

3/12 _____

4/16 _____

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Transportation Math Test

Name_____ Age_____ Date_____

School_____ Examiner_____

1. If you are earning $3.50 per hour and work 40 hours each week, what would you be earning? _____

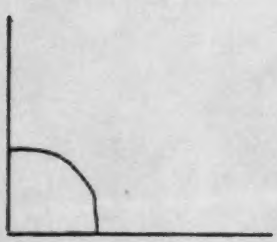
2. If you borrowed $500.00 from a bank for one year to buy a car and the interest rate was 15%, what would be the total amount due at the end of the year? _____

3. You are buying four new tires at $50.00 each. What will the total bill be including 5% sales tax? _____

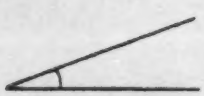
4. If you are operating a service business and a part has a list price of $100.00 and you receive a 30% discount, what would be the cost of the part after the discount has been subtracted? _____

5. If a tire has a circumference of 120 inches, what would be the circumference in feet? _____

Measure the following angles:



_____



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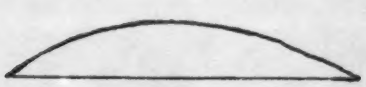

_____

15 +33	78 +91	37 + 8	78 +91
9 -6	39 -17	63 -28	146 - 89
9 x8	32 x4	48 x16	205 x74
32 x4	57 x8	92 x6	205 x74
8/72	8/192	4/2000	24/1248

Write the decimal which represents "nine tenths" _____

Write the decimal which represents "forty-five hundredths" _____

Write the decimal which represents "two hundred and twenty five thousandths" _____

Convert into decimals:

3/10 _____

35/100 _____

9/10 _____

345/100 _____

265/100 _____

85/100 _____

Convert into fractions:

.65 _____

.3 _____

.46 _____

.09 _____

.345 _____

.809 _____

Measure the following lines:

1. 1. _____

2. 2. _____

3. 3. _____

4. 4. _____

5. 5. _____

6. 6. _____

7. 7. _____

8. 8. _____

9. 9. _____

Measure the following angles:

APPENDIX D

STUDENT INTERVENTION SCHEDULES

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

RELATED READING & MATHEMATICS

STUDENT SCHEDULE

Long Branch

	READING	MATH	READING	MATH	READING
	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 - 9:00 Manufacturing	M.P. E.M.	S.S. E.M. D.D.	M.P. E.M.	S.S. E.M. D.D.	M.P. E.M.
9:00 - 9:30 Manufacturing	D.D. A.K.	A.K. T.M.	D.D. A.K.	A.K. T.M.	D.D. A.K.
9:30 - 10:00 Service	G.M. C.M.	L.B. M.I.	G.M. C.M.	L.B. M.I.	G.M. C.M.
10:00 - 10:30 Service	S.V.	C.M.	S.V.	C.M.	S.V.

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

RELATED READING & MATHEMATICS

STUDENT SCHEDULE

Tinton Falls

	MATH	READING	MATH	READING	MATH
	Monday	Tuesday	Wednesday	Thursday	Friday
8:50 - 9:30 Transportation	B.G. D.J. J.L.	R.C. G.P.	B.G. D.J. K.L.	R.C. G.P.	B.G. D.J. J.L.
9:30 - 10:10 Plumbing	T.P. C.C.	A.D. E.C.	T.P. C.C.	A.D. E.C.	T.P. C.C.
10:10 - 10:45 Carpentry	B.D. J.B. T.H.	T.H. J.C. W.R.	B.D. J.B. T.H.	T.H. J.C. W.R.	B.D. J.B. T.H.

APPENDIX E

INDIVIDUALIZED LESSON PLANS

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Student_____ Class_____ Instructor_____

DATE STARTED	OBJECTIVE	ACTIVITY	MATERIALS USED	PROGRESS	GRADE

APPENDIX F

PERFORMANCE RECORD

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

VOCATIONAL PROGRAM: _____

TEACHER: _____

READING/MATH OBJECTIVE: _____

VOCATIONAL TASK: _____

DESCRIPTION OF ACTIVITIES: _____

MATERIAL USED: _____

APPENDIX G

READING PRE AND POST TEST DATA

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

RELATED READING PROGRAM

NAME	SURVIVAL WORDS			SHOP WORDS			SORT		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
BUILDING TRADES									
J. C.				62	94	+32	2.7	3.7	+1.0
E. C.				47	87	+40	3.5	5.4	+1.9
T. H.				69	88	+19	3.6	4.9	+1.3
FOOD SERVICE									
C. M.	47	65	+18				1.8	2.7	+ .9
G. M.	56	71	+15	+30	+68	+38	2.4	3.8	+1.4
S. V.	31	61	+30	28	63	+35	1.5	3.1	+1.6
MANUFACTURING									
D. D.	48	64	+16				1.7	3.1	+1.4
A. K.	38	57	+19				1.0	2.9	+1.9
TRANSPORTATION									
R. C.				31	81	+52	2.7	4.7	+2.0
G. P.				32	71	+39	3.3	4.7	+1.4

APPENDIX H

THE RESULTS OF THE REMEDIATION OF THE DEFICIENCIES IN THE RELATED MATHEMATICS PROGRAM

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading & Mathematics Skill Matrix

Students	MULTIPLICATION												ADDITION OF FRACTIONS				SUBTRACTION OF FRACTIONS				MEASUREMENT				Reading
	Tables 1-5	6-9	2x1	3x1	2x2	3x2	3x3	Operations	Decimal to Fractions	Fractions to Decimal	Reducing	Like Denomination	Unlike Denomination	Mixed Numbers	Like Denomination	Like Denomination Mixed Numbers	Unlike Denomination	Unlike Denomination Mixed Numbers	Whole Numbers	1/2	1/4	1/8	
W. D.*											(X)		(X)								(X)	X	10
H. H.																							8
K. M.									X	X													
J. B.*									(X)	(X)	(X)	X	X	X	X	X	X	X			(X)	X	9
T. H.*									X	X	(X)		(X)	X			(X)	X					7
R. C.									X	X	X	X	X	X			X	X					9
J. C.									X	X													6
W. R.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
S. L.	X	X	X	X	X	X	X	X	X	X					X	X	X	X		X	X	X	9
*Note: Students selected for																							
intervention																							

MANUFACTURING

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading and Mathematics Skill Matrix

Students	Addition			Subtraction		Multiplication								Time					Division		Measurement		Word Problems	Reading
	Without Carrying	With Carrying	4 Addends	Without Regrouping	With Regrouping		Tables 1-5	Tables 6-9	Multiplies 2x1	Multiplies 2x2	Multiplies 3x2	Multiplies 3x3	Operation	Hour	1/2 Hour	1/4 Hour	Minutes	Writing Time in Numbers	One Digit Divisor	Two Digit Divisor				
A. K.*			x	(x)	x			x		x	x	x	x	(x)	x	x	x	x	x	x	x		x	38
D. D.*					x	x	x	x	x	x	x	x	x			x	x	x	x	x	(x)	x	x	48
R. V.																								
T. M.*	x	x	x	(x)	x	x	(x)	x	x	x	x	x	x	(x)	x	x	x	x	x	x	x	x	x	73
S. S.*		x	(x)				(x)	x	(x)	x	x	x	x		(x)	x	x	x	(x)	(x)	x	x	(x)	80
M. P.		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	23
E. M.		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	22
*Note: Students selected for intervention																								

Plumbing

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading and Mathematics Skill Matrix

STUDENTS:	MEASUREMENT				MULTIPLICATION												
	1"	1/2"	1/4"	1/8"	Tables 1-5	6-9	2x1	3x1	2x2	3x3	Operation	Rounding of No. 10's	Rounding of No. 100's	Angles	Word Problems	Reading	
R. T.																100	
H. S.															X	100	
C. C.*											(X)				(X)	81	
K. R.		X	X	X									X	X	X	93	
T. P.*		(X	X	X		(X)						(X)	X	X	(X)	60	
A. D.										X		X	X	X	X	8	
A. D.			X	X								X	X	X	X	99	
E. C.		X	X	X		X							X		X	47	
M. L.	X	X	X	X	X	X	X	X	X	X	X	X	X		X	88	
K. L.									X	X	X				X	84	
*Note: Students selected for intervention																	

MONMOUTH COUNTY VOCATIONAL SCHOOL DISTRICT

Related Reading and Mathematics Skill Matrix

	Addition				Subtraction			Multiplication							Division		Measurement				Fractions				
STUDENTS:	Without Regrouping	Regrouping	3 Digit Numbers	3 or More Addends	Without Regrouping	Regrouping	Zeros in Subtrahend	Tables 1-5	Tables 6-9	Multiplies 2x1	Multiplies 2x2	Multiplies 3x2	Multiplies 3x3	Operation	With Remainders	Without Remainders	1"	½"	¼"	1/8"	Reducing Fractions	Double & Half	Measures Equivalent	Word Problems	Reading
J. S.											X		X		X	X		X	X	X		X	X		99
J. T.													X	X	X	X		X	X	X	X	X	X		98
G. M.*															(X)	X	(X)	X	X	X	X	X	X		30
P. N.									X			X		X	X	X	X	X	X	X	X	X			95
L. B.*						(X)	X				X	X	X	X	X	X	X	X	X	X	(X)	X		X	97
M. I.*				X		X	X		(X)		X	X	X	X	X	X	(X)	X	X	X	X	X	X	X	91
M. F.*			X			X	X		(X)		X		X	X	X	X	(X)	X	X	X	X	X		X	90
S. V.						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	28
C. M.		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	45
N. R.						X	X		X				X	X	X	X	X	X	X	X	X	X	X	X	99
*Note: Students selected for intervention																									

[redacted] COUNTY VOCATIONAL SCHOOL DISTRICT

Transportation

Related Reading & Mathematics Skills Matrix

STUDENTS:	ADDITION		SUBTRACTION		MULTIPLICATION						DIVISION		MEASUREMENT							
	Without Carrying	With Carrying	Without Regrouping	With Regrouping	Tables 1-5	6-9	2x1	2x2	3x2	Operation	Without Remainder	With Zeros	1 Inch	1/2	1/4	1/8	Decimal to Fractions	Fractions to Decimal	Angles	Reading
H. P.														X	X	X			X	9
R. C.																				3
M. B.														X	X	X				10
S. S.		X							X					X	X	X				9
R. G. *						(X)		(X)		X				(X)	(X)	(X)		(X)	X	7
D. J. *			(X)	X		(X)		(X)									X	X	X	8
J. L. *													X	X	X	X	(X)	X	(X)	8
J. C.										X				X	X	X	X	X	X	6
G. P.		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3
M.F. *													(X)	X	X	X	X		(X)	
*Note: Students selected for intervention																				
																	76			

APPENDIX I

ADVISORY COMMITTEE

SPECIAL NEEDS ADVISORY COMMITTEE

NAME	ADDRESS
Jesse Whitehead, Jr. School Psychologist	Monmouth Regional High School Tinton Falls, New Jersey 07724 (542-1170)
Al Emmons LDTC	Freehold Twp. High School, Elton & Adelphia Road, Freehold, New Jersey (431-8457)
Mr. Michael Maddaluna Career Ed. Coordinator	St. Dept. of Ed., Mon. Cty. Office Campbell Ct. & Hwy 9, Freehold, New Jersey (431-7823)
Joseph Keisman Spec. Ed. Coordinator	Freehold Regional District, Gibson Place, Freehold, New Jersey 07728 (431-8524)
Mrs. Patricia Sokolow Adv. Grp. Rep. ACLD	475 Portaupeck Avenue, Oceanport, New Jersey (229-3715)
Mr. & Mrs. Lynn Peary Parents	78 Grand Avenue, Atlantic Highlands, New Jersey (291-3277) Bus. (872-1468)
Mrs. Patricia Custer Parent	19 Pinewood Drive, Manalapan, New Jersey (536-2294)
Mrs. Ruth Ingles Soc. Res. for HEW-Parent	1404 Francis Drive, Wall, New Jersey (681-3127)
Ms. Elizabeth Reichard Mgr., Salaried Personnel	Bendix Corp., 118 Hwy. 35 Eatontown, New Jersey (542-2000)
Mr. Fred Tanis Photo Art Stencil & Sign Co.	701 - 17th Avenue, South Belmar, New Jersey (681-7300)
Robert Stemplinger Director, Spec. Svcs.	Shore Regional High School, Hwy. 36 West Long Branch, New Jersey (222-9300)
Dan Will Manager	Mon. Center for Voc. Rehab., 54 Broad Street, Red Bank, New Jersey (842-4700)
William McDermott Guidance Director	Raritan High School, Middle Road Hazlet, New Jersey (264-8400)
Hugh McCullough Ass't. Superintendent	Howell Twp. Schools Howell, New Jersey (938-6161)
Alex Bruno Office of the Handicapped	East Main Street, Freehold, New Jersey (431-7399)
Ms. Ann Prairie, LDTC	Special Services, Keansburg High School, Port Monmouth Road, Keansburg, New Jersey (787-7639)
Ms. Anita Kneely	United Cerebral Palsy Center 75 Bath Avenue, Long Branch, New Jersey (222-4731)
Bill Ditto Coordinator	504 Watch Dog, Bd. of Social Services Freehold, New Jersey (431-6110)
Margaret Lancton Supervisor of Child Study	State Dept. of Ed., Mon. Cty. Office, P.O. Box 1264, Freehold (431-7811)